



October 19, 2015

Also sent via email

Mr. Jim Orr, R.G.
Oregon Department of Environmental Quality
Northwest Regional Office
Suite 600
700 NE Multnomah St.
Portland, OR 97232

Dear Mr. Orr:

Re: ECSI 138, Northwest Pipe Company Portland plant; response to comments

This letter presents Northwest Pipe Company's response to the comments on the March 2015 Remedial Investigation and Source Control Evaluation (RI/SCE) report (Report) for the Northwest Pipe Portland facility that were received in the following two letters:

- The U.S. Environmental Protection Agency's (EPA's) April 29, 2015 letter, which you requested our response to in our June 11, 2015 conference call
- The Department of Environmental Quality's (DEQ's) August 31, 2015 letter, portions of which we discussed with you and Matt McClincy of DEQ on September 17, 2015, and further clarified on October 7, 2015.

Both EPA's and DEQ's comments were divided into two sections: General Comments and Specific Comments. Our response in this letter follows this structure. In the following text, agency comments are presented in italic font and Northwest Pipe Company (NWP) response in normal font.

As we have indicated in prior communications, we believe a meeting with DEQ, EPA, and Northwest Pipe representatives to discuss key points regarding these comments would be instrumental in resolving lingering disagreements, producing a final document, and establishing an agreed path to completing the SCE and moving forward with resolving matters associated with the RI. Specifically we wish to discuss EPA General Comment 1, EPA Specific Comment 2 & 3, DEQ General Comment 2 and DEQ Specific Comment 8, and any others communicated to Northwest Pipe ahead of time by DEQ that may be triggered by our responses contained in this letter.

Comments and Responses

EPA General Comments

EPA General Comment 1: As stated in comments on the January 2014 Draft Final RI/SCE Report, additional groundwater monitoring data is needed to evaluate the groundwater pathway at the site. The data presentation in the RI/SCE indicates a southwest trending tetrachloroethene (PCE) plume extending from Southeast Area monitoring well MW5 to the Port of Portland Terminal 4 monitoring well T-4-MW-03S. In 2005, the PCE and vinyl

chloride concentrations at monitoring well T-4-MW-03S were 14 and 5.4 µg/L, respectively, exceeding the February 2015 Preliminary Remediation Goals (PRGs) that have been established for the Portland Harbor site (0.24 and 2 µg/L for PCE and vinyl chloride, respectively) by up to 58 times. Monitoring well T-4-MW-03 S is located less than 100 feet from the edge of Slip 1 and the PCE and vinyl chloride concentrations in surface water at Slip 1 have not been determined.

Response: While we recognize EPA here is providing an opinion regarding a perceived need for additional groundwater monitoring data, there are a few factual errors in this comment.

First, the assumption that VOCs in groundwater detected at the Northwest Pipe property have or potentially will ever migrate to the Port's monitoring well T-4-MW-03s is an assumption for risk evaluation purposes and such a migration pathway has not been established or confirmed.

Second, PCE has been detected not only in MW-5 and in certain other wells further downgradient, it also was detected above the PRG of 0.24 microgram per liter (µg/L) in each of the four direct-push groundwater samples collected offsite east of the Northwest Pipe property boundary, including in sample locations situated upgradient of MW-5 and other Northwest Pipe monitoring wells. When combined with the consistent south-southwesterly groundwater flow direction observed in the Southeast Area of the site, this observed distribution of VOCs in groundwater means a source for at least some of the observed VOCs may be located upgradient and offsite of the Northwest Pipe facility.

Third, well T-4-MW-03S is not located "less than 100 feet from the edge of Slip 1" but is actually located approximately 180 feet from the edge of water in Slip 1, according to Figure 11 of the Remedial Investigation Report for the Terminal 4, Slip 1 Upland Facility (prepared in 2007 by Ash Creek Consultants and Newfields for the Port of Portland).

Fourth, we note that EPA, when referring to a PRG that has been exceeded by "up to 58 times," elected to use a temporary spike in the PCE concentration for well T4-MW-03s that was substantially different from other observations in that well and was not confirmed in a subsequent sample collected approximately 3 months later. The other concentrations observed in this well, including the most recent sample, exceeded the PRG by factors ranging from 3 to 8.

Lastly, we would like to respectfully note that comparing PRGs for surface water exposure, including consumption of aquatic organisms, to monitoring wells completed in an aquifer where none of the aquatic organisms on which the PRG is based exist, is highly conservative and has limited practical significance.

EPA General Comment 1 (continued): The RI/SCE concludes that the potential for groundwater to exceed protective standards is very low because groundwater data indicates that PCE and trichloroethene (TCE) concentrations are decreasing at the site. A new Figure 6-6 was added to the RI/SCE to present time versus PCE and TCE concentrations, which demonstrate trends in groundwater at the site. The time versus PCE and TCE concentration plots presented in Figure 6-6 incorrectly plot the last data point in the time series (i.e., August 2007) as 0 µg/L for PCE and TCE concentrations at all monitoring wells. This is misleading and the trend plots should be corrected. The actual concentrations, based on data presented in Tables 5-2 and 5-12, show an increasing PCE trend at MW-05, with PCE concentrations increasing from 52 µg/L in 2004 to 1,400 µg/L in 2007. Concentrations at monitoring wells MW-03 and MW-04 also increased between 2005 and 2007. Data collected at the

Terminal 4 monitoring well T4-MW-03S from April 2004 through May 2005 does not show a stable trend in PCE and vinyl chloride concentrations. Given the increasing trend at some of the monitoring wells in the Southeast Area, unstable concentration trends at monitoring well T4-MW-03S, and the lack of data more recent than 2007, additional groundwater monitoring should be performed to evaluate PCE and related VOC concentration trends and plume stability. Until contaminant concentration trends in groundwater are determined, the evaluation of the risk due to contaminated groundwater discharging to surface water is inconclusive.

Response: Figure 6-6 will be revised.

EPA noted that the concentration of PCE in MW-5 increased from 52 µg/L in 2004 to 1,400 µg/L in 2007. Northwest Pipe is, of course, aware of these data. Because MW-5 is the most upgradient well on Northwest Pipe property, located about 50 feet downgradient of the property boundary with only a roadway and a finished water pipe storage area occupying this space, we believe the increase in concentration noted by EPA is consistent with the effect of an offsite plume containing PCE migrating onto and across the Northwest Pipe property, as noted in Section 5.2.1.2 of the RI/SCE report.

The maximum concentration observed in MW-5 (1,400 µg/L PCE in September 2007) is lower than the maximum concentrations historically observed at other sampling points further downgradient, such as probes GP1 (9,800 µg/L PCE in September 2001), GP2 (4,300 µg/L PCE in September 2001), and MW-6 (2,800 µg/L PCE in September 2005). Because VOC concentrations migrating onto Northwest Pipe's site from upgradient are less than those previously observed in Northwest Pipe groundwater samples located further downgradient, the increase noted in EPA's comments would not be expected to cause concentrations further downgradient to be higher than may have occurred in the past.

EPA goes on to suggest that wells further downgradient, specifically MW-3 and MW-4, "also increased between 2005 and 2007." This suggestion is inconsistent with concentrations observed at these wells in January 2005 and September 2007, where we actually observed decreases of concentrations as described below:

- MW-3 PCE concentrations: 20 µg/L (January 2005) and 16 µg/L (September 2007), a decrease of 20 percent
- MW-4 PCE concentrations: 190 µg/L (January 2005) and 150 µg/L (September 2007), a decrease of 21 percent

While PCE concentrations in these wells temporarily dipped slightly below their January 2005 and September 2007 concentrations in samples collected later in 2005, such variations in concentration are normal and expected for groundwater samples collected at different points in time and do not necessarily indicate a consistent trend.

EPA also notes that Port monitoring well T4-MW-03S "does not show a stable trend in PCE and vinyl chloride concentrations." As EPA well knows, concentrations of constituents in groundwater monitoring wells routinely fluctuate to varying degrees over time due to a variety of factors. Moreover, Northwest Pipe is unaware of a regulatory requirement for a "stable trend" in groundwater concentrations. If one examines the data for PCE and vinyl chloride in T4-MW-03S, it appears that concentrations generally are low and near the reporting limit of 0.5 µg/L for both constituents, with a transient spike in concentration that occurred in August 2004 for vinyl chloride and January 2005

for PCE. Both constituents subsequently dropped substantially in subsequent samples:

- Vinyl chloride concentrations went from 5.4 µg/L to 1.3 µg/L and then to below the reporting limit of 0.5 µg/L
- PCE concentrations went from 14 µg/L to 1.9 µg/L, which is the final sample collected by the Port at the well and which is quite similar to the concentrations observed previously in this well (0.77 µg/L in April 2004 and 1.8 µg/L in August 2004)

Rather than indicating a significant or alarmingly unstable trend, these data instead appear to reflect an apparent short-term spike in concentration that was not confirmed in subsequent samples and does not appear to have any particular significance. Again, as EPA well knows, such spikes are relatively common in groundwater monitoring data sets.

Lastly, EPA commented on the absence of any subsequent groundwater monitoring data since 2007. As EPA may be aware, Northwest Pipe has worked cooperatively with a succession of multiple DEQ project managers to develop several investigation plans for the site, including groundwater, from 2000 until the final RI supplemental investigation work plan were developed with DEQ in 2008 and implemented over the following years. Northwest Pipe met with DEQ's project manager and his team on many occasions throughout 2009 up to the submittal of the RI/SCE in March 2015 to discuss lingering agency concerns about the site and to agree on sampling programs to satisfy those concerns. At no point did DEQ require additional groundwater sampling. To the contrary, several DEQ project managers have communicated to Northwest Pipe that the groundwater pathway is of no specific concern and was believed by the DEQ to be incomplete. This was reiterated just a few months before the RI/SCE report was submitted in DEQ's November 2014 Portland Harbor Upland Source Control Summary Report, which characterized the groundwater situation at Northwest Pipe as "not significant or connected to the river."

Northwest Pipe disagrees with EPA's suggestion that a risk exists due to contaminated groundwater discharging to surface water, because for a risk to exist, several simultaneous, yet equally unlikely circumstances would have to exist, specifically:

- No further attenuation of PCE and vinyl chloride concentrations would occur in the aquifer over the 180-foot flow path to the slip despite favorable conditions for reductive dechlorination and unavoidable mechanical dispersion processes that function even in the absence of microbial degradation
- No mixing of groundwater and tidally-influenced, flowing surface water as groundwater seepage to the river discharges and migrates vertically and laterally into the river
- No volatilization, photolysis, hydrolysis, or biodegradation in the river
- Bioaccumulation into aquatic organisms of constituents with very low octanol-water partition coefficients that neither EPA nor DEQ classifies as bioaccumulative
- Consumption of fish at high rates of intake, one hundred percent of which would consist of fish living their entire lives in Slip 1 of Terminal 4 at the precise point of discharge of the groundwater represented by Port well T4-MW-03s, with the angler likewise obtaining one hundred percent of fish consumed from that same place
- Development of an untreated surface water supply intake as a drinking water source located a short distance downstream of combined municipal sewers permitted to discharge raw sewage to the river under certain circumstances multiple times per year, despite the Surface Water Treatment rule which would require treatment

works to be constructed to treat turbidity and biological contaminants, yet no effort would be made to also treat other contaminants

In summary, when considering all the site groundwater samples taken over the investigation period (2004-2007), concentrations of VOCs in site groundwater are trending toward decreasing levels over time, with the exception of a plume migrating onto the Northwest Pipe site from upgradient.

EPA General Comment 2: The stormwater collection and treatment system at this site is critical for prevention of discharging stormwater with unacceptable levels of polyaromatic hydrocarbons (PAHs), polycyclic biphenyls (PCBs), and metals to Outfall 18/WR-123 and the Willamette River. To be protective, the system must have sufficient flow capacity and volume to handle significant storm events that are defined in Section 2.4.3 as a storm event of 0.83 inches of rainfall within 24-hours (criteria encompasses all storm events contributing 90 percent of the total annual runoff). Based on the information presented in Section 2.4.3 and Appendix D, the maximum capacity of the storm water treatment system is 630 gallons per minute (gpm) and the total detention volume is 46,547 gallons. There is insufficient information presented to evaluate whether or not this capacity is adequate to handle stormwater runoff during the 0.83 inches of rainfall over a 24-hour storm event. The estimated runoff rate during the 0.83 inches rainfall event should be stated in the report and the runoff rate should be compared to the maximum capacity of the treatment system.

Response: The system has a capacity to treat 907,200 gallons per day (gpd), based on 630 gallons per minute (gpm) total treatment capacity. The design rain event is 0.83 inch per day, which, over the 28 acre area of the facility, totals 631,066 gpd of runoff. This means that the total treatment capacity is approximately 44 percent greater than the runoff produced during the rain event specified in the City of Portland's Stormwater Management Manual. This information will be added to Appendix D.

EPA General Comment 3: The Hydrologic and Hydraulic Model presented in Appendix D does not provide sufficient information to evaluate the performance of the collection system and piping. While the modeled hydraulic grade line for baseline conditions during 2-, 10-, and 25-year storm events and the location of collection components and pipe are provided, the hydraulic grade line for the regraded scenario is not provided. In addition, the runoff rates for the 2-, 10-, and 25-year storm events during the baseline and regraded scenarios are not provided. The report states that a 10-year storm event total flow rate equates to a flow rate of 43 cubic feet per second (19,200 gpm); however, this seems too high given rainfall rates in Portland and would exceed the capacity of the stormwater treatment system (630 gpm). Documentation of the modeling results presented in Appendix D is required for EPA to assess the regraded scenario model.

Response: The Appendix D model was not related to stormwater treatment system capacity, but was instead a predictive hydraulic evaluation of the stormwater conveyance system. It was intended to evaluate the conveyance system's ability to handle anticipated runoff associated with regrading and paving portions of the Northwest Pipe facility. This predictive model is moot in light of 4 years of actual site observations since the regrading and paving project was completed. These observations indicate that the stormwater conveyance system is adequate for managing stormwater conditions without interfering with facility production or site management.

EPA General Comment 4: The hydraulic evaluation for the treatment system used the 0.83 inches of rainfall over 24-hour (i.e., 90 percent of annual runoff) to estimate stormwater runoff and the hydraulic modeling for the collection and piping system used 2-, 10-, and 25-year storm events to estimate stormwater runoff. The report should explain why these different scenarios were used to estimate runoff to the collection and piping system and to the treatment system.

Response: Different precipitation scenarios were used because the objectives of the two projects differed. The stormwater collection and piping system modeling related to the site grading and pavement project and was intended to evaluate whether the site's stormwater conveyance system capacity was capable of handling anticipated flows under different storm events. The hydraulic evaluation of the stormwater treatment system, on the other hand, was to assess whether the Aquip treatment system could manage flows generated by the storm event required for design cited in Appendix E of the City of Portland's Stormwater Management Manual, which had to be met in order for NWP to re-grade its surfaces.

EPA General Comment 5: The effluent from the stormwater treatment system should be monitored for PAHs, PCBs, and arsenic in addition to other NPDES 1200-Z parameters to ensure that the system is operating properly and confirm that stormwater discharging from the site is not adding contaminants to the Willamette River at concentrations that may pose a risk to human health or the environment. If ongoing stormwater monitoring data indicates exceedances of NPDES 1200-Z or other Portland Harbor specific benchmarks, then additional stormwater source control measures/best management practices may need to be implemented.

Response: Site stormwater is monitored pursuant to the facility's July 2012 1200Z Industrial Stormwater Discharge Permit. This permit requires monitoring for copper, lead, zinc, pH, total suspended solids, oil and grease, iron, aluminum, cadmium, nickel, aldrin, DDT, DDE, pentachlorophenol, PCBs, and PAHs (acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene and pyrene). The response to monitoring results is stipulated in Schedule A of the permit.

EPA Specific Comments

EPA Specific Comment 1: Section 2.3, Page 2.4.3 -- The detention volumes for the Outfall 3 and Outfall 4 stormwater treatment systems are listed as 29,462 and 17,085 gallons, respectively, in Section 2.4.3; however, the Stormwater Operations & Maintenance Plan lists the storage as 4,730 and 3,740 cubic feet (35,383 and 27,977 gallons), respectively. It is recommended that this discrepancy in detention volumes be addressed.

Response: EPA is correct that a slight discrepancy in storage capacity exists between different documents. The Outfall 3 treatment system has a total storage capacity of 33,365 gallons. This value is 95 percent of the total capacity of 35, 121 gallons. The Outfall 4 treatment system has a total storage capacity of 26,630 gallons. This value is 95 percent

of the total capacity of 28,032 gallons. The documents will be modified for consistency.

EPA Specific Comment 2: Section 5.2.2.1, Page 5-7 - The assumption that the observed groundwater concentrations of chlorinated solvents in monitoring well MW-5 indicates a potential offsite source with the plume migrating onto the site is not supported by the lower concentrations of PCE detected in groundwater at the boring between monitoring well MW-5 and the rail spur (i.e., geoprobes GW 11, GP-108, GP-109, GP-110, and GP-111). The lower concentrations at these locations need to be addressed in the context of the hypothesis that an off-site plume is migrating onsite; otherwise, the hypothesis should be dismissed or modified. It is recommended that this concern be addressed.

Response: Geoprobe sample location GP-109, -108, -107, and -106 all are located offsite, east-northeast and upgradient of the Northwest Pipe site boundary. Each of these samples contained PCE concentrations exceeding the PRG of 0.24 µg/L when they were analyzed in 2004, with one of them (GP-107) having a higher PCE concentration in July 2004 (66 µg/L) than observed less than one month later in MW-5 (52 µg/L). Total chlorinated ethene concentrations in GP-107 (282.4 µg/L) also exceeded the contemporaneous total concentration exceeded in MW-5 (220.4 µg/L). These observations support a conceptual model describing a higher-concentration, offsite plume migrating onto Northwest Pipe's property from upgradient. Subsequent increases in MW-5 concentrations are consistent with, and support this conceptual model.

In addition, the preponderance of degradation products (cis 1,2-dichloroethene and vinyl chloride) observed in upgradient groundwater samples ranged from 31 percent to 81 percent of the total chlorinated ethene concentration (expressed as a mole fraction). This situation is consistent with there being an upgradient source located some distance away from the eastern Northwest Pipe site boundary; far enough upgradient to allow substantial PCE and TCE degradation to have occurred prior to being measured just before flowing across the site boundary onto the Northwest Pipe site, which is another line of evidence supporting our conceptual model for the site.

Lastly, groundwater elevation measurements indicate that the hydraulic gradient in the shallow aquifer at the site consistently is directed to the south-southwest.

As noted previously, the higher concentrations noted by EPA that subsequently have been observed in MW-5 is likely an indication of an offsite plume continuing to migrate onto the Northwest Pipe property.

Each of these lines of evidence support the hypothesis noted in the RI/SCE document that at least one of the sources of the PCE plume observed on the Northwest Pipe property appears to have originated offsite to the east or east-northeast of the site. EPA's assertion that the hypothesis of an upgradient source is "not supported" and "should be dismissed or modified," is incorrect based on these lines of evidence.

EPA Specific Comment 3: Section 6.2.9, Page 6-5 --As stated in Specific Comment 2, PCE concentrations in groundwater collected from the geoprobe borings between monitoring well MW-5 and the rail spur do not support the idea of an offsite upgradient source. While the PCE concentration at monitoring well MW-5 is not the maximum concentration observed at the Southeast Area, the data presented in Tables 5-2 and 5-12 indicated an increasing trend at this monitoring well. As stated in General Comment 1, additional monitoring at monitoring well MW-5 and other monitoring wells at the Southeast Area and Port of Portland Terminal 4 is need to evaluate the stability of the groundwater plume. It is

recommended that this data gap be addressed.

Response: Northwest Pipe respectfully disagrees with the opinion expressed by EPA. The hydraulic gradient and the contemporaneous groundwater sample results presented in the RI/SCE report and summarized in the response to Specific Comment 2 support the RI/SCE report's hypothesis that at least a portion of the observed PCE (and other chlorinated ethenes) in groundwater in the Southeast Area of the Northwest Pipe Site appears to have originated offsite to the east or east-northeast of the facility. Also as noted in the previous response, the increasing trend in MW-5 concentrations is likely a reflection of continued onsite migration from the east-northeast.

EPA Specific Comment 4: Table 6-5 - The footnote to the table states that values exceeding the 2004 NRWQC 175 g/day consumption rate are in bold; however, many of the groundwater results in the table exceeding this criteria are not indicated as bold (e.g., monitoring wells MW-4, MW-5, and MW-6). It is recommended that the table be modified so that all results exceeding the NRWQC criteria are in bold.

Response: As indicated in its title, Table 6-5 is a human health risk screening table for onsite VOCs, focusing on vapor inhalation and worker exposure to groundwater in a hypothetical excavation. Given the location of the wells evaluated in this table, over 1,000 feet from the nearest downgradient surface water body, comparison against a fish consumption-based screening level is illogical. The footnote is a copy-and-paste error and will be corrected.

EPA Specific Comment 5: Appendix B, Operations Manual for Stormwater Filtration System -- Aside from the minimum once a year removal of sediment from storm drain basins and lines, there is no criteria for when sediment must be removed. The manual should include criteria for what depth of accumulated sediment measured during the monthly inspection will trigger removal of sediment from the catch basin or storm drain line. It is recommended that this omission be addressed.

Response: The topic noted in Comment 5 is not an omission. Northwest Pipe Company's experience after more than a decade of catch basin inspection and maintenance is that an annual removal effort is sufficient to address the minor amounts of solids that settle into catch basins and storm water conveyance lines. No additional criterion is warranted.

DEQ General Comments

DEQ General Comment 1: DEQ requests that NWP address the screening of all constituents of interest and issues discussed in our letter and the EPA Letter. DEQ concurs with all the concerns identified in the EPA Letter. Please consider them to be DEQ's comments.

Response: Based on further discussion of this comment in our conference call on September 17, 2015, Northwest Pipe understands that all constituents of DEQ's interest were screened in the March 2015 RI/SCE report, but DEQ is interested in Northwest Pipe using the recently-released (July 29, 2015) preliminary remediation goals (PRGs) prepared by EPA as screening levels. Relevant tables and discussion will be revised to reflect these PRGs. Northwest Pipe notes that this is not the first time that DEQ has asked for screening tables to be revised to reflect updated values released by the regulatory agencies. This

topic was discussed in our meeting with DEQ in July 2014 and DEQ agreed to a lock-down date for comparison values to avoid this from recurring. Northwest Pipe had assumed that the submittal of our revised RI/SCE report in March 2015 would represent such a lock-down date. Is this something that DEQ will request periodically into the future? If so, why hasn't DEQ requested other parties in the area, such as the Port, to periodically update its documents to reflect ever-changing targets?

DEQ General Comment 2: The SCE presents a conclusion that there is not a risk from chemicals in groundwater. Groundwater concentrations near the IT slip exceed ambient water quality criteria for PCE and vinyl chloride, indicating a potential risk from consumption of water and organisms exposed to water in the Slip 1 of Terminal 4 and a potential impairment of the beneficial use of groundwater.

Response: The conclusion presented in the March 2015 RI/SCE document is generally consistent with that presented by DEQ for the Northwest Pipe site in its November 21, 2014 Source Control Summary Report. Because both documents rely on the same groundwater data set, it is not surprising that they present consistent conclusions.

Northwest Pipe is aware that, using PRGs such as those recently revised by EPA, groundwater concentrations measured by the Port of Portland in a Port monitoring well located about 180 feet from the Port's Slip 1 exceed PRGs for PCE based on Oregon ambient water quality criteria assuming consumption of water and aquatic organisms (though the most recent concentrations for these constituents – 1.9 µg/L PCE and no detectable vinyl chloride at a reporting limit of 0.5 µg/L, which is below the PRG for vinyl chloride of 2 µg/L – are very low by any reasonable measure). As we have discussed, this is an easy comparison to make, but it also is highly conservative and fails to account for a substantial number of other conservative factors outlined in the RI/SCE report and summarized above in this letter in the response to EPA General Comment 1. Consequently Northwest Pipe disagrees that this comparison represents a reasonable likelihood that a potential risk exists.

Lastly, we understand from our discussion in our September 17 conference call that, when DEQ refers to "potential impairment of the beneficial use of groundwater," the "use" to which it is referring is the passive discharge of groundwater to the Willamette River, and the "potential impairment" is the result of comparing PRGs based on surface water and aquatic organism consumption to water samples in a groundwater monitoring well located 180 feet inland from surface water, where no consumption of aquatic organisms or water occurs.

DEQ General Comment 3: The report combines screening and reporting elements for both SCE and upland risk which results in a confusing narrative. DEQ requests that these issues be separated in future reports. The specific details of this and other concerns are presented below and in the EPA Letter.

Response: Comment noted. Northwest Pipe has worked with DEQ to produce three different drafts of a combined RI/SCE report, in 2005, 2014, and 2015, each of which contained an SCE and an RI with elements of an upland risk assessment, yet this is the first time DEQ has made this comment. Northwest Pipe will work with DEQ to resolve the specific items DEQ finds confusing.

DEQ Specific Comments

DEQ Specific Page ES-3, Expanded Risk Assessment for Chlorinated Solvents in Groundwater

Comment 1: *The conclusion presented in the Executive Summary is that there is no risk from chemicals in groundwater. Groundwater concentrations near the IT slip exceed ambient water quality criteria for PCE and vinyl chloride, indicating a potential risk from consumption of water and organisms exposed to water in the slip. This observation is repeated in the EPA letter. Please address this concern.*

Response: Northwest Pipe assumes DEQ is referring to Slip 1 of Port of Portland Terminal 4 rather than the IT Slip. The responses to EPA General Comment 1 and DEQ General Comment 1 provide additional discussion on Northwest Pipe's perspective on this matter.

DEQ Specific Section 6.2.10 Ecology

Comment 2: *The statement that in the IT Slip, "ecological habitat is neither fostered nor encouraged" may be correct, but it is misleading. The slip is favored by fish species such as small mouth bass and crappie, regardless of whether the slip was intended to be habitat. Please clarify by adding the following statements: "Some fish, such as smallmouth bass, are attracted to in-water structures, and are therefore likely to be attracted to the slip. Also, fish may use slips as refuges and resting areas away from the main channel of the river."*

Response: The report will be revised to include the following statement:

"Some resident piscivorous fish, such as smallmouth bass, are affiliated with certain in-water structures, and therefore may be found in the slip. Also, native anadromous fish may use the slip as a temporary refuge and resting area away from the main channel of the river."

DEQ Specific Section 6.3.1.3 Offsite Recreational User Scenario

Comment 3: *The statement that the T4 and IT slips "are not intended to be used, nor are they much used, for fishing" is not factual. The intent may be to not have fishing in the slips, but DEQ has frequently observed fishing in these areas. In addition, a local fishing club indicated that because the slips are attractive to some species and they are good areas to fish. Please remove the statement.*

Response: The sentence will be revised to delete the phrase "nor are they much used."

DEQ Specific Section 6.2.1.4 Offsite Drinking Water Scenario

Comment 4, part 1: *The report presents a line of evidence that use of water from the Willamette River is a "remote possibility". While, DEQ may agree with NW Pipe on the likely future use of this portion of the Willamette River for drinking water, EPA considers water from the Willamette as a potential drinking water source.*

Response: DEQ's comment refers to Section 6.2.1.4 Offsite Drinking Water Scenario, but in an email from Jim Orr on 10/01/2015, DEQ corrected the reference to Section 6.2.12.4.

DEQ withdrew Comment 4 in an email dated 10/07/2015.

DEQ Specific Section 6.3.1.4 Conclusions for Human Health Risk Screening

Comment 4, part 2: *Conclusions regarding risks from human exposure to zinc cannot be used as the basis for drawing ecological risk conclusions. Aquatic ecological screening levels for zinc are*

considerably lower than human health screening levels. Screening should be conducted for both human health and ecological receptors using the appropriate screening values.

Response: DEQ withdrew Comment 4 in an email dated 10/07/2015.

DEQ Specific Section 6.4.1.3 Exposure

Comment 5, Aquatic Water Quality Criteria are established using standard approaches that DEQ

part 1: considers reasonable. The approach includes bioaccumulation into fish by consumption of benthic organisms that are more likely to be exposed to chemical concentrations in groundwater that have not been substantially diluted. It is not appropriate to consider this process as "uncertain". This section requires significant rewriting to reflect the SCE screening process.

Response: The referenced section is an Uncertainty Evaluation, which is a standard element in risk assessment documentation and is recommended in DEQ Human Health Risk Assessment Guidance (DEQ, October 2010). It outlines some of the uncertainties underlying a comparison of using screening levels based on surface water exposure to groundwater concentrations observed a considerable distance upgradient of the point of discharge to surface water. It describes neither Ambient Water Quality Criteria nor the process used to develop them as "uncertain."

DEQ Specific *Chemical concentrations in the main channel of the river are not an issue to evaluate for*
Comment 5, SCE. Aquatic organisms will be exposed to concentrations in the slip because slips are good
part 2: habitat for many species, and fish find refuge in the slips from the main flow of the river
and also feed closer to shore. EPA and DEQ do not conduct risk assessments assuming
contact with water in the main channel of the river, and instead focus on areas where
exposure is likely. Please remove the discussion of the main channel.

Response: The reference to the main channel of the Willamette River will be revised to refer to Slip 1 of the Port's Terminal 4.

DEQ Specific Section 7 Groundwater Pathway

Comment 6: The SCE determination that the groundwater pathway is incomplete is not supported by the investigation. Final DEQ source control decisions are based on a DEQ accepted SCE report and subject to EPA review/comment as required by the Portland Harbor Memorandum of Understanding. Please modify this section to reconsider the current SCE of the groundwater pathway.

Response: As noted in the response to DEQ General Comment 1, the conclusion presented in the March 2015 RI/SCE document is consistent with that presented by DEQ for the Northwest Pipe site only a few months prior in its November 21, 2014 Source Control Summary Report. Moreover, Northwest Pipe is aware of no affirmative data, either current or historical, that show the groundwater pathway to the river to be complete for constituents originating on the Northwest Pipe site. As requested by DEQ, Section 7 will be revised to more fully discuss the groundwater pathway, taking into account DEQ's and EPA's comments and presenting weight-of-evidence evaluation as described in Section 5.2 of the 2005 Portland Harbor Joint Source Control Strategy.

DEQ Specific Section 5-6 Stormwater System Investigation

Comment 7: Line abandonments were proposed but DEQ has not received information to support that the work occurred. Completion or documentation of the abandonments is needed to assure that recontamination is not likely and to support a source control decision. Please submit current information regarding line abandonments.

Response: NWP will provide an update to CH2M HILL's Technical Memorandum recommendations in Section 5-6, as well as in Table 7-1, of the Report.

DEQ Specific Section 8 Final Source Control Sampling and Evaluation

Comment 8: The statement that "stormwater is the only potentially complete pathway for constituents to reach the Willamette River from the Site" should be modified to include groundwater. Please correct this statement in this section and the rest of the SCE to reflect that the groundwater pathway is complete.

Response: Northwest Pipe respectfully disagrees that data indicate the groundwater pathway to the river is complete for constituents originating on the Northwest Pipe site. We find this comment particularly surprising because the DEQ has historically agreed with NWP conclusions that the GW pathway is insignificant, and even stated so in its November 2014 Source Control Summary Report submitted to EPA.

DEQ Specific Table 5-2 Historical Groundwater Results

Comment 9: The historical groundwater sample results from 2001 through 2005 are tabulated but the data points are not included on site maps. Analytical results are presented in various units. All tabulated analytical data should be presented as the same units in screening values. Please correct table analytical units and missing data points on the maps and figures.

Response: Regulatory comparison criteria for water commonly are reported in either milligrams per liter (for example, maximum contaminant levels) or micrograms per liter (for example, DEQ ecological screening level values). The units used in the report are correct, however the report will be revised so it uses consistent units in the tables and figures for concentrations and values against which those concentrations are compared. Northwest Pipe disagrees with DEQ's characterization that data points are missing on maps. The maps are provided as a visual convenience to DEQ to understand the conceptual model. There is no requirement in regulation or guidance to present all concentrations measured for each constituent on maps. Instead, reports presenting multiple maps depicting a similar distribution of constituent concentrations in soil or groundwater can overwhelm and confuse a reader to such a degree that it impairs comprehension. NWP will consider DEQ's request for *additional* mapping if, in Northwest Pipe's opinion, additional maps have practical utility in presenting the site conceptual model or nature and extent of constituents that have a material relevance to the RI/SCE.

DEQ Specific Tables 6-9 and 6-10

Comment 10: Laboratory qualifiers should be explained. For example "=" is not defined.

The analytical values shown for PCE are not correct for well T4S1MW-10. Please correct.

Response: The tables will be revised to define each of the symbols and qualifiers used. Based on DEQ's October 7, 2015 email, Northwest Pipe understands the remainder of this comment is withdrawn.

DEQ Specific Figure 5-7 Southeast Area Geoprobe and Monitoring Well Locations with PCE Concentrations

PCE and associated constituents should be presented in additional figures and screened against all SCE parameters.

Response: Figure 5-7 is provided as a visual convenience, and all the laboratory results are provided in full in Tables 5-2 and 5-12. In each of the prior two drafts of the RI/SCE report submitted for DEQ review and comment (2005 and 2014), Northwest Pipe used PCE as an indicator compound to depict the extent and magnitude of VOC concentrations in the Southeast Area of the site. DEQ did not raise the issue of preparing additional figures showing other constituents at any of the prior report reviews in the RI/FS process at Northwest Pipe. It is unclear why, this late in the process, DEQ has originated a new request for additional maps for "all SCE parameters," particularly when, as noted in these comments, only PCE and vinyl chloride are above PRGs in one well located closest to the river (and, for vinyl chloride, only if one cherry-picks an unusually high concentration not confirmed by subsequent sampling). Northwest Pipe will consider additional mapping if it helps clarify the conceptual model or depict the nature and extent of constituents that have material relevance to the SCE. However, we respectfully decline to develop new figures for all SCE parameters.

DEQ Specific Figure 6-6

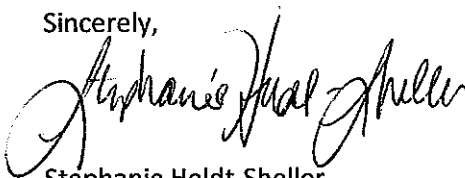
Comment 12: *The graphs presented in Figure 6-6 contained substantial errors. For instance the data plots assumed an end point of zero in place of the detection limit for a specific sample. The EPA letter addressed several other issues that require correction. Please reconstruct the graphs considering DEQ and EPA comments.*

Response: Figure 6-6 will be revised. The oversight that caused an error in Figure 6-6 has no influence on the conclusions of the RI/SCE document, so Northwest Pipe disagrees that the error, while regrettable, is substantial.

Closing

If you have any questions regarding the responses presented in this letter, please do not hesitate to contact me at sheldtsheller@nwpipe.com or Ken Shump of CH2M at ken.shump@ch2m.com.

Sincerely,



Stephanie Heldt-Sheller
Northwest Pipe Company
Corporate Environmental Manager

Cc: Mike Wray/Northwest Pipe Company (PDF copy)
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Mike Merchant/Black Helterline LLP (PDF copy)
Ken Shump/CH2M (PDF copy)
Gretchen Gee/CH2M (PDF copy)
Matt McClincy/DEQ (PDF copy)
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